Penetration, Riser & Shaft Management | Mirvac Minimum Requirements

1. Purpose & Scope

The purpose of this document is to eliminate or minimise the risk of injury when working in, or near, penetrations, risers and shafts, so far as is reasonably practicable.

This document applies to all workplaces under the management or control of a Mirvac entity.

2. Minimum Requirements

Mirvac personnel and Service Providers must have processes in place to ensure compliance with:

- the Critical Controls (refer Section 3);
- relevant Forms (refer Section 4);
- all relevant Legislation, Codes of Practice and Standards (refer Section 7); and
- product guidelines for installation, use or maintenance from the Original Equipment Manufacturer (**OEM**).

3. Critical Controls

Penetrations

Control measures shall consider the hierarchy of control (refer examples in the Hierarchy of Controls Triangles in Section 9). Preference should be given to controls in the following order:

1. design out penetrations;
2. erect guardrails around penetrations with adequate screening to prevent dropped objects; and
3. install covers with fixings that are adequate for the force to which they will be subjected.

Covers and/or guard railing, including fixing methods, must be certified by an engineer to confirm mechanical strength for the location / application and comply with relevant legislation, codes and Standards. Additionally:

- all penetrations with an opening greater than 200mm x 200mm must be protected by means of covers or barricades or a combination of both, together with signage;
- covers shall be designed and installed so they do not present a tripping hazard and are clearly signposted (e.g. **“Danger Penetration Below” or “Danger Hole Beneath”** or similar). Where applicable, installation should be according to the OEMs instructions/design (for proprietary systems) or according to instructions in this document (e.g. for plywood covers and similar) and subject to regular documented inspections by the Workplace Foreman or Supervisor using the Work Area HSE Inspection Form;
- covers must be securely fixed e.g. screwed or bolted (not nail fixings). The area Supervisor must visually inspect and confirm correct installation of all penetration covers following installation;
- all horizontal penetrations must be protected with covers and/or guardrails to prevent the fall of materials or persons, and which are designed for the location and the identified pedestrian, plant and equipment loadings and the SWL clearly marked on the cover;
- reinforcing mesh covers alone are not sufficient for horizontal penetrations. Instead they must have a covering designed to prevent small items from falling through e.g. sheet metal, plywood, plastic or shade-cloth suitable for the location, identified activities, tools and materials.
- all vertical penetrations identified as a potential fall hazard, e.g. into a shaft, or void, must be protected with covers or barricades which are designed for the function and location, and where view is obstructed, clearly signposted e.g. “**Danger Penetration Behind**”;
- if covers or guardrails are removed for construction purposes, fall control (prevention or protection) measures must be maintained for personnel while the penetration is unprotected and they must be replaced before the area is left unattended;
- wheel stops will be installed where horizontal penetrations are in trafficable areas, e.g. forklift or EWP operation;

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- during formation and after stripping of formwork, the formwork contractor will cover and secure all penetrations;
- covers and/or guard railing are to be maintained until the penetration is permanently closed off or filled;
- the formwork contractor is responsible for the installation of a plywood cover and warning signs to each lift and fire stair shaft prior to the jump-form climbing sequence. The lift shaft plywood covers are replaced with full height 'Lift guards' once the shaft has been handed over to the lift contractor;
- stair voids in housing construction must be protected by the installation of a stair void cover installed by the supplier/agent;
- large unglazed window openings above 2000mm from ground level must have a temporary handrail installed at between 900 – 1100mm from internal floor level, with a mid-rail and toe boards; and
- air conditioning floor voids must be protected with a cover (form or engineered plywood) of adequate strength fixed to the floor by screws, and clearly signposted “Danger – Hole Beneath”.

Pier Holes

The target for drilled pier foundations, is that only those pier holes which can be completed the same day should be drilled, reo-installed and concrete poured. If for any reason a pier hole is not able to be completed and needs to be left overnight or longer, then the following must occur:

- pier holes up to 250mm in diameter, and not greater than 1000mm deep, must be protected by fitting 50 x 50 x 5 steel reo mesh, extending at least 400mm outside the perimeter of the pier hole secured to the ground by pegs at each corner. Erect bunting or mesh supported on star pickets around the pier hole to highlight the hazard and fitted with a sign “Danger – Hole Beneath”; and
- pier holes greater than 250mm in diameter, and more than 1000mm deep, must be protected by 50 x 50 x 5 steel reo mesh, extending at least 600mm outside the perimeter of the pier hole, secured to the ground at multiple locations. A secure handrail frame should be erected to surround the pier hole, with a top-rail between 900 – 1100mm from ground level, with mid rail and toe boards and 1000mm from the perimeter of the pier hole and fitted with a sign “Danger – Hole Beneath”. Alternatively, a steel plate large enough to cover the pier hole and extending 400mm around the perimeter of the pier hole may be placed by crane or excavator; or, the drilling company may supply a vertical steel tube, providing handrail height protection, placed over the pier hole.

Inspections

The person in control of the area must inspect areas daily where there are identified penetrations. This includes atypical areas such as roof and back of house areas. The following must occur:

- any covers or guardrails found to be damaged, removed, not secured or ineffective are to be rectified at once and reported to workplace management, and the area barricaded and made safe until the cover can be reinstated;
- covers must consistently provide protection from tools and materials from falling on to people below;
- hot work activity risk assessments must be reviewed for the potential for hot sparks or waste to fall through penetrations, onto people or igniting flammable materials below and identify suitable control methods; and
- penetration protection must be reviewed when it is determined that the loadings or activities have, or are planned to change.

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4. Mirvac Forms

Checklists and Permits are to be completed and then authorised by Mirvac representative prior to work	
Public Area and Workplace Shutdown-Start-up Checklist – end of day inspection that site is left safe	Work Area HSE Inspection Form Supervisors to be used for work area HSE Inspections of penetration, riser and shaft covers

5. Roles and Responsibilities

The Mirvac Workplace Manager of each workplace over which Mirvac has control is responsible to ensure workers at the site are aware of and adhere to the performance requirements of this document and responsible to ensure workers are equipped with adequate tools, training, competency and licensing to undertake the work.

6. Competency and Training

Minimum Training Requirements for penetration Riser & Shaft Management	
Activity	**Required Training**
Installation of proprietary Penetration Cover Systems	Training in the OEM Installation Process
Inspection of proprietary Penetration Cover Systems	Awareness of the OEM Installation Requirements

7. Relevant Legislation, Codes of Practice and Standards

Document Title	
NSW:	Work Health and Safety Act 2011 (NSW) Work Health and Safety Regulation 2017 (NSW) (including Part 3.1 (regs 32 – 38), Part 3.2 (regs 39 – 41, 54, 55), Part 4.4 Falls (regs 78 – 80))
Vic:	Occupational Health and Safety Act 2004 (Vic) Occupational Health and Safety Regulations 2017 (Vic) (including Part 3.5)
Qld:	Work Health and Safety Act 2011 (Qld) Work Health and Safety Regulation 2011 (Qld) (including Part 3.1 (regs 32 – 38), Part 3.2 (regs 39 – 41, 54, 55), Part 4.4 Falls (regs 78 – 80))
ACT:	Work Health and Safety Act 2011 (ACT) Work Health and Safety Regulation 2011 (ACT) (including Part 3.1 (regs 32 – 38), Part 3.2 (regs 39 – 41, 54, 55), Part 4.4 Falls (regs 78 – 80))
WA:	Occupational Safety and Health Act 1984 (WA) Occupational Safety and Health Regulations 1996 (WA) (including Chapter 3, Division 5 — Prevention of falls at workplaces)
AS/NZS 1657 Fixed platforms, walkways, stairways & ladders – Design, construction & Installation.	
AS/NZS 1891.4 Industrial fall arrest systems & devices - Selection, use & maintenance	
AS 4431 Guidelines for safe working on a new lift installation in new constructions	
AS/NZS 4389 Roof Safety Mesh	

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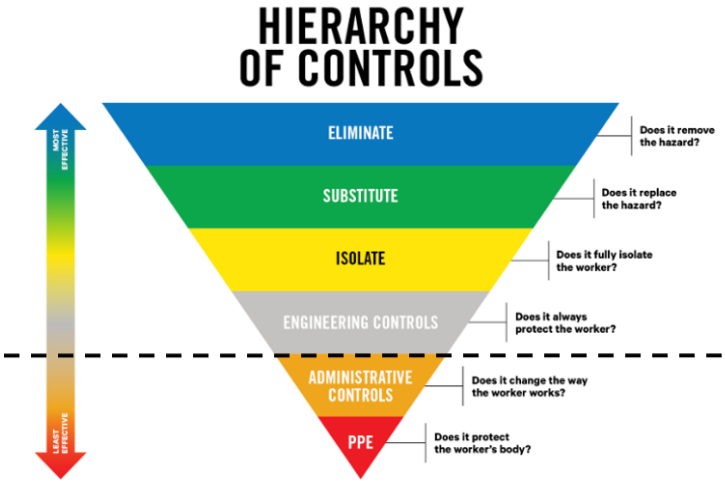
8. Additional Information

[Temporary Works – Design & Installation MMR]

9. Hierarchy of Controls Triangle – Penetration, Riser and Shaft Management



- Cast-in mesh while form-working to cover penetrations
- Pre-cast columns with reo in situ
- Design handrails into false car and running platform roofs

- Substitute with materials that are finished prior to installation

- Fix rated penetration covers to isolate from penetrations
- Covers around services in risers to prevent
- Catch decks in lift shaft to protect those below

- SWMS and work processes requiring safe distance from penetrations
- Use automated rope lowerers for rope install and replacement

- Access work area from EWP or scissor lift to protect from penetrations
- Training, SWMS/JSEA, Permits

- Fall protection harnesses worn and attached

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